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OXC-2537
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30 October 1961

MEMORANDUM FOR THE RECORD

25X1A SUBJECT: Trip Report, 24 - 27 October 1961, to P & W (Fla.) and M-H (Fla.) by [redacted]

25X1A 1. [redacted] MB/DFD, visited P & W, West Palm Beach, Florida, 24 - 25 October 1961 and M-H, St. Petersburg, Florida, 26 - 27 October 1961. The trip to P & W was made 25X1A in the company of [redacted], who is presenting the results of that visit in a separate report. The purpose of these visits was for orientation and project review.

2. Status of the inertial navigation systems being manufactured by M-H is as follows:

a. The first INS engineering model is at LAC, Burbank. It had 1000 hours of laboratory test time upon delivery to LAC.

b. The second INS engineering model is at M-H, St. Petersburg. It has 1500 hours laboratory test time, with approximately 300 hours between failures. Laboratory acceptance testing is scheduled for completion 1 November 1961.

c. The first production INS has been accepted from production and qualification tests are now beginning. Delivery is scheduled for 1 January 1962, after completion of 900 hours of testing. Qualification tests include checking for effects of shock, vibration, humidity, extreme temperature, power variation, frequency response of platform and altitude (low pressure). These tests were not made on the two initial engineering models.

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d. Subsequent units will have 300 hours of testing upon delivery. 25X1A

e. Check-out and bench test equipment and personnel [redacted] 25X1A are at St. Petersburg, ready to go.

3. A discussion with [redacted] of the M-H 25X1A St. Petersburg facility, revealed concern on his part for delays in flight testing the INS. His concern is shared by this writer. While it is proposed that the INS be installed on the number one A-12, the equipment will not have the cockpit display and controls installed for the first three months of flight test. The space for this INS cockpit equipment will be occupied by the autopilot test equipment, so as to permit determination of gain settings which are to be pre-set in the autopilot. This will permit no useful testing of the INS during this period.

4. Information desired by M-H personnel is:

a. Location of the flight test area and major geographical locations that can be used as position fixes.

b. Ambient operating conditions (vibration, temperature, etc.) at the INS mounting area in the aircraft.

c. A-12 test schedule from LAC to enable M-H to coordinate their activities on a time basis.

5. Comments and recommended action:

a. The INS in production is an accurate and reliable system in the laboratory.

b. Qualification testing should be followed immediately by flight testing. The use of an A-12 is not mandatory for initial flight development testing; virtually any jet aircraft will provide statistical operating data and accuracy checks. Many system deficiencies can be found and eliminated prior to integrated testing with the A-12. A bomber or transport aircraft is desirable to provide in-flight observation and trouble shooting by the manufacturer's

representatives. Costs and security limitations preclude easy access to this type. Other limitations, conditions and requirements are:

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(1) There is adequate ground support and test equipment available [redacted] St. Petersburg to support a test program.

(2) An autopilot which can be connected to the INS is desirable althoughnot absolutely essential.

(3) Bleed air for cooling is required.

(4) Power requirements are listed in attachment one. These should not be difficult.

(5) A drift sight is required to give position fixes at periodic intervals for INS in-flight recalibration.

(6) Environment of the equipment should duplicate the conditions under which it will be used in the A-12 as nearly as possible.

(7) Since the error buildup in the INS is a function of time rather than distance, flights on the order of eight to ten hours should be contemplated.

(8) Any test of this system should include extensive flight over polar regions.

The requirements listed above point to a drift sight-equipped U-2 as the most logical vehicle readily available for testing the INS at an early date. It is recommended that this possibility be given serious consideration. Guidance is requested if further investigation and tentative scheduling efforts by DB are desired.

c. The information desired by M-H as to flight test area can be provided in general terms if desired. The flight test area for this equipment is envisioned to be the ZI, Alaska and on up to the North Pole. Approval is requested prior to advising M-H. The information desired on operating environment cannot be provided with any degree of accuracy until flight test of the A-12 is begun.

d. It was found necessary in the U-2C program to provide the pilot with in-flight capability of varying autopilot gain to maximize autopilot performance. A similar arrangement would appear to be profitable in A-12 operation.

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Attachments: Power requirements, INS
M-H and task force organization charts

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DB/DPD-DD/P [redacted]
Distribution:
Orig - Ch/DB/DPD
2 - "
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